Volume Title: Geography and Ownership as Bases for Economic Accounting

Volume Author/Editor: Robert E. Baldwin, Robert E. Lipsey and J. David Richards, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-03572-7

Volume URL: http://www.nber.org/books/bald98-1

Publication Date: January 1998

Chapter Title: A Measure of the Current Account Related to the Well-Being of Japan: Generational Accounts in the Open Economy

Chapter Author: Eric O'N. Fisher

Chapter URL: http://www.nber.org/chapters/c6825

Chapter pages in book: (p. 315 - 334)

10 A Measure of the Current Account Related to the Well-Being of Japan: Generational Accounts in the Open Economy

Eric O'N. Fisher

10.1 Introduction

An article entitled provocatively "Hollywood 1, Japan 0" appeared recently in the national press (Sterngold 1995). It reported that the president of Matsushita Electric Industrial Company paid a brief visit to the chairman of the American entertainment conglomerate MCA early in April 1995 and informed him coldly that Matsushita had sold its controlling interest in MCA to Seagram's, a Canadian firm. This foreign direct investment was the single largest purchase of an American corporation by a Japanese firm; Matsushita had acquired MCA for $6.6 billion in 1990 and sold 80 percent of its stake for $5.7 billion in 1995. During the same period, the comparable return from holding an open position in yen was greater than 13 percent per year. How do investment decisions like this one affect Matsushita's shareholders? Also, if this kind of foreign direct investment is typical of the flow of capital out of Japan in the past two decades, what are the macroeconomic implications of the continuing Japanese external surplus of the past 15 years?

This chapter answers these questions in two ways. First, it describes two new measures of a country's external surplus that are based in economic theory. One is called the *aggregate generational current account,*[1] and the other pre-

Eric O'N. Fisher is associate professor of economics at The Ohio State University.

The author thanks Jon Haveman, conference participants, and two anonymous referees for helpful comments on an earlier draft of this chapter. He also thanks Eric Ramstetter, Hajime Miyazaki, Masao Ogaki, Takeshi Kohno, Nao Ikemoto, Masanori Hashimoto, Bob Lipsey, Guy Stevens, and the Osaka University Institute for Social and Economic Research for help in collecting and interpreting the data used in this chapter. The author will make available at cost a diskette containing all the data and forecasts of exogenous variables used in constructing the statistics reported in this chapter.

1. Fisher (1995) defines the aggregate generational current account, and Fisher and Woo (1997) calibrate this statistic for the postwar Korean economy. The term "aggregate generational current account" is a bit of a misnomer because in practice one ignores the generational heterogeneity that

sents a generational cross section of the net foreign assets of Japanese residents. Both extend the important work of Auerbach, Gokhale, and Kotlikoff (1991) to the open economy. Second, it uses data from Japan's balance of payments in the past two decades to calibrate these measures. The value of Japan's external assets, measured at market prices, has been somewhat higher than that of its net international investment position, measured at historical prices. This fact is true because the surge in Japanese outward investment occurred in the first part of the past decade. Although Japanese investments in real estate in the United States have suffered some spectacular recent losses,[2] Japan's overseas assets have enjoyed large capital gains because securities prices in world markets have risen sharply in the past 15 years.

The measures calculated in this chapter are intuitively related to the well-being of the Japanese. The aggregate generational current account is the entire profile of the annual change in the expected present value of net foreign assets broadly defined. Thus it captures changes in the expected present value of the goods and services that a country can import from abroad. For domestic residents, one aggregate generational current account profile is ex ante Pareto superior to another if, at all time horizons, the present value of the stock of net foreign assets is greater for the former than the latter. For example, consider a one-off capital gain that increases the present value of Japan's net foreign assets. This change raises the expected utility of some Japanese residents and thus, with an appropriate internal redistribution of wealth, permits a Pareto improvement for all current and future residents. On the other hand, consider an increase in Japan's expected official transfers to abroad, perhaps as a part of a commitment to pay for the Allies' military expenses in the Gulf War. Such a transfer implies an analogous Pareto worsening for the residents of Japan.[3]

The aggregate generational current account is constructed in two big steps. First, one determines the market value of net foreign assets. Second, one capitalizes expected transfers from abroad. The sum of these two after any history is a country's net foreign assets position defined broadly. The present value of

is at the heart of Auerbach, Gokhale, and Kotlikoff's measure. The phrase "a utility-theoretic measure of the external surplus" is perhaps too pompous. I have elected to use the phrase "aggregate generational" to place my work firmly within the tradition started by those authors and continued recently by Ablett (1996). Auerbach, Gokhale, and Kotlikoff (1994) give a nice overview of the literature on generational accounts.

2. On 12 May 1995, the front page of the *New York Times* reported that Mitsubishi Estate Company, the holding company that had purchased an 80 percent stake in Rockefeller Center for $1.4 billion, was filing for bankruptcy. The *Survey of Current Business* (May 1994, tables 5.1 and 5.2) shows that real estate purchases represented about 15 percent of Japanese direct investment into the United States in 1992 and 1993. This is a small fraction of Japan's purchases of dollar-denominated securities in those years.

3. The utility generated by the provision of public goods has not as yet been incorporated into the calculation of generational accounts. Thus the appropriate comparison here is between a world in which the Japanese enjoy the benefits of global military security without having to pay unilateral transfers and one in which the Japanese enjoy these benefits and also shoulder some concomitant financial burdens.

this stock of assets puts the current account into an intertemporal framework.[4] Finally, first differences of this present value show how the stock of external assets evolves across time and through history. If the aggregate generational current account is consistently positive, as is the case for Japan in the 20 years between 1973 and 1992, then a country's net foreign assets are increasing more rapidly than world interest rates over a long horizon. In a dynamically efficient world economy, such a situation represents the expectation of a higher future standard of living owing to expected investment income from abroad.

The aggregate generational current account thus uses two standard techniques of generally accepted accounting principles: first, it evaluates net foreign assets at market value, not historical cost; and, second, it forces the economist to use an accrual accounting method to evaluate foreseeable international commitments. From a theoretical perspective, both of these practices make enormous sense. Of course, the difficulty in constructing theoretically meaningful economic statistics is that they are only as good as the assumptions one uses to compute them.

In this chapter, I assume that no Japanese transfer to abroad is enduring. Thus the consistently negative balance for unilateral transfers on current account does not reflect the expectation of an enduring Japanese commitment to a larger geopolitical role. If this assumption is wrong, then I have overestimated the level of Japan's net foreign assets. Also, I have evaluated Japan's net foreign assets only in four regions: the United States, Western Europe, the Communist bloc, and Australia. Japan has played a historically important role in several rapidly growing Asian economies. Since I have excluded these countries from my analysis, I may have underestimated the value of Japan's net foreign assets. Further, I have used equity prices, bond prices, and exchange rates from the United Kingdom only to revalue all of Japan's Western European assets. If the rates of return on European assets in general have been higher in the past 20 years, then I have underestimated the level of Japan's net foreign assets. Finally, I have assumed that Japan's assets in the United States have borne market rates of return. If Japanese investors suffer consistently large losses from real estate holdings, then I have overestimated slightly their net foreign assets in the United States.

This chapter also presents a generational cross section of the net foreign assets of Japan in 1992. Using data on household savings and borrowing rates, I construct the portfolios of net foreign assets of 19 different age cohorts. Different groups hit their years of peak savings in different years. Thus some generations benefited quite substantially from the large capital gains that Japan's overseas investments experienced in the past decade, while others had not yet

4. Since nominal interest rates include a component for expected inflation, the present value of the stock of net foreign assets deflates these assets both for inflation and the opportunity cost of holding real balances. Ulan and Dewald (1989) correct the U.S. stock of net foreign assets for inflation and for market value effects, but they do not consider the full implications of the dynamic pattern of asset accumulation.

accumulated sufficient wealth to have gained much from that boom. For example, this generational profile of net foreign assets shows that Japanese residents in their forties and fifties stand to lose proportionally most from a drop in dollar-denominated bond prices, whereas older generations lose less because they do not hold as large portfolio shares in dollar-denominated assets.

The broad picture that emerges from the data is that the market value of Japan's overseas assets was about 30 percent higher in 1992 than the Bank of Japan's official estimates. The rate of return on European assets was quite high, whereas assets held in the United States bore positive but not stellar returns. Since Japan held about $680 billion in net foreign assets in 1992, the degree of interdependence between Japan and the world economy is probably greater now than at any other time in history.

The rest of this chapter consists of four sections. Readers interested in the theoretical arguments showing that the conventional current account is ill defined should focus closely on section 10.2. Section 10.3 presents rough calculations of the market value of Japan's net foreign assets from 1973 through 1992. That section calibrates a benchmark using the status quo ex ante in the world economy in 1992. Section 10.4 presents the generational cross section of the distribution of these assets. Then it analyzes the effects on the welfare of Japan of three different scenarios: a continued strong yen, higher dollar interest rates, and rapid Chinese economic growth. Section 10.5 presents a brief conclusion. The chapter ends with a data appendix.

10.2 An Illustrative Model

Consider a country trading in a larger world economy. There are two generations, and the world economy lasts for two periods: the present and an uncertain future. Uncertainty is summarized by a random variable whose realization is denoted by $\theta \in \Theta$, the latter denoting the set of all possible future states of the world. This random variable summarizes both intrinsic and extrinsic uncertainty in the market, and its distribution is common knowledge. Intrinsic uncertainty is related to production, consumption, and government policy decisions, while extrinsic uncertainty captures the notion that market equilibria may be subject to a degree of randomness independent of the fundamentals of the world economy.

In the domestic economy, there is one representative agent in each generation. Agent 0 lives for one period only, and agent 1 lives for two periods. Let x_0^1 be the vector describing agent 0's consumption bundle; a subscript denotes a person and a superscript denotes a time period. Since x_0^1 has several elements, one can think of it as consisting of many different goods and services, both traded and not traded, that influence the utility of agent 0. Likewise, the state-contingent consumption profile of agent 1 is $[x_1^1, x_1^2(\theta)]$. Preferences for the people in the domestic economy are summarized by $u_0(x_0^1)$, a utility function for agent 0, and $E\{u_1([x_1^1, x_1^2(\theta)])\}$, an expected utility function for agent 1,

where the expectation is taken with respect to the information available in the first period.

Let a_0^1 be the value of agent 0's initial assets, y_0^1 her income, and g_0^1 the domestic government's net transfers to her. Net transfers from the domestic government are positive if the agent's subsidies exceed her tax obligations. Likewise, a_1^1 is the initial wealth of agent 1, $(y_1^1, y_1^2(\theta))$ that agent's income profile, and $(g_1^1, g_1^2(\theta))$ his state-contingent government net transfers. It will be convenient to denote the ex post interest rate by $i(\theta)$.

Assume that asset markets are complete. Then a rational expectations equilibrium will entail that agents choose consumption plans that maximize expected utility subject to the usual budget constraints. Let c_0^1 and $(c_1^1, c_1^2(\theta))$ be solutions to these problems. Agent 1's consumption plans depend in general on risk aversion, expected domestic and foreign transfers, and the profile of earned income. Now let $s_1^1 - a_1^1 = y_1^1 + g_1^1 - c_1^1$ be the increment to agent 1's assets. Since $-a_0^1 = y_0^1 + g_0^1 - c_0^1$, the conventional current account in period 1 is $b^1 = s_1^1 - (a_0^1 + g_0^1) - (a_1^1 + g_1^1)$, the excess of domestic savings over investment. Likewise, the conventional current account in period 2 is $b^2(\theta) = -[a_1^2(\theta) + g_1^2(\theta)]$, where $a_1^2(\theta) = [1 + i(\theta)]s_1^1$ is the law of motion for agent 1's assets. Thus the *conventional current account profile* is

$$(1) \qquad [b^1, b^2(\theta)] = [s_1^1 - (a_0^1 + g_0^1) - (a_1^1 + g_1^1), -(a_1^2(\theta) + g_1^2(\theta))].$$

The essence of Fisher's (1995) argument is that the term $s_1^1 - a_1^1$ is not well defined. Consider a fixed level of initial wealth for agent 1. Then one can always increase b^1 by raising net transfers from abroad by one dollar and then imposing a offsetting state-contingent decrease in transfers in the amount of $1 + i(\theta)$ in the next period. This change in the timing of transfers has no effect on the present value of the wealth of any agent after any history, and the consumption and utility of each agent is unchanged in any state of the world. But the conventional current account surplus has risen. Since the equilibrium allocations of the agent in the world economy are unchanged, agents' expected utilities are not affected after any history. This argument is the essence of a general proof showing that the conventional current account can take on any value in all but the final period of any economy. In an economy with an infinite horizon, the conventional current account is arbitrary in every period! Since each agent's expected utility is not affected by the timing of these transfers, changes in the conventional current account profile need not be related at all to changes in the welfare of domestic residents.

How should one interpret the rescheduling of these unilateral transfers from abroad? If this country has a valued fiat asset, then the government improves the conventional current account simply by delaying payments to abroad and promising foreigners principal and interest in the next period. Thus this year's net interest payments from abroad and conventional current account have increased. If the economy has no such asset, then the timing of transfers from abroad is a rescheduling of sovereign debt that leaves the present value of debt

service unchanged in every state of the world. This "infusion of foreign official capital" leaves the present value of the equity of any international creditor unchanged, but it allows the conventional current account of the debtor country to be anything.

Rescheduling taxes and transfers among the agents in the domestic economy does not influence the current account. Kotlikoff (1993) shows that a one dollar decrease in g_1^1 that is offset by a future increase of $1 + i(\theta)$ in the next period lowers current savings s_1^1 just as much as the decrease in g_1^1. Of course, this delayed transfer affects no agent's utility after any history. Still, the conventional current account is not affected. Thus rescheduling internal taxes and transfers is another policy tool allowing the government to make its internal deficit any number it wants in all but the final period!

What is a well-defined measure of the external surplus? Let $\tilde{a}_0 = d_0^1 + f_0^1 + t_0^1$ be the present value of agent 0's assets, where d_0^1 denotes assets located domestically, f_0^1 net assets abroad, and t_0^1 the expected value of all current and future transfers from abroad. Since this definition includes expected foreign transfers, $\tilde{a}_0$ is thus broader than a_0^1. Also, there is no superscript on this quantity because these assets incorporate the present value of all current and expected future transfers from abroad that accrue to agent 0. This definition is thus independent of time. Likewise, let

$$\tilde{a}_1 = d_1^1 + f_1^1 + t_1^1 + E\{(1 + i(\theta))^{-1} t_1^2(\theta)\},$$

where the expected value of transfers accruing to agent 1 is explicit.

Further, let $f^1 = f_0^1 + f_1^1$ be the present value of private net foreign assets of all current and future agents in the domestic economy at time 1. For a creditor country, $f^1 > 0$ might be the market value of equity owned reflecting past savings decisions of the economy. Likewise, let $t^1 = t_0^1 + t_1^1 + E\{(1 + i(\theta))^{-1} t_1^2(\theta)\}$ be the aggregate values of net foreign assets net expected transfers from abroad. These transfers are assets in a broad sense because they reflect the capitalized value of foreign economic aid. Both these aggregates are indexed by a time superscript because they represent the aggregate value of current and future net foreign assets, conditional on the history of the world economy up until time 1. These aggregates are independent of agents because they sum across all current and future agents in the domestic economy.

In this simple economy, the profile of net foreign assets evolves according to the realization of the state of nature in the second period. Since there is only one (current and future) domestic agent in the second period, the present value of the aggregates $f^2(\theta) = [1 + i(\theta)]^{-1} f_1^2(\theta)$ and $t^2(\theta) = [1 + i(\theta)]^{-1} t_1^2(\theta)$ should cause no confusion. Again, these aggregates depend only on time since the history of the world economy evolves through time. If the expected value of net foreign assets was zero in the status quo ex ante,[5] the *aggregate generational current account profile* is

5. This assumption is not innocuous. The aggregate generational current account is defined as a flow, just as the conventional current account is. In practical applications, one takes first differ-

$$(2) \qquad [\tilde{b}^1,\ \tilde{b}^2(\theta)] = [f^1 + t^1,\ (f^2(\theta) - f^1) + (t^2(\theta) - t^1)].$$

The aggregate generational current account is the (history dependent) change in the expected present value of net foreign assets, broadly defined, across all generations alive and not yet born. This definition shows that a country's welfare includes a component capturing the expected transfer of real resources from abroad. In a more general model, equation (2) would sum across an infinite sequence of generations of domestic residents.[6]

Equation (2) defines the aggregate generational current account as the change in the history-dependent stock of net foreign assets. In practical applications, it is natural to construct annual changes in order to facilitate comparisons with the conventional current account. But, in this and many other economic models, the demarcation of a period serves two functions: it keeps track of calendar time and differentiates between agents. Generational accounts are really indexed by the agents in an economy, and this fact has important implications for how to use them.[7] Since the aggregate generational current account is the increase in the present value of assets owned abroad, a surplus in this measure indicates that net foreign assets have risen more rapidly than the nominal interest rate. Thus current and future generations can expect a larger inflow of goods and services than was the case before.

The aggregate generational current account is useful for two purposes. First, it determines the extent to which a country's standard of living depends on receipt of goods and services from abroad. For example, if $\tilde{b}^2(\theta) > 0$, then agent 1 owns net foreign assets whose market value is larger than the initial net foreign asset position of the economy. This increase is larger than the loss in net foreign assets that occurred when agent 0 liquidated her portfolio, and it represents a high rate of domestic savings, realized capital gains, or unexpected transfers from abroad. There is an inherent legal asymmetry between net assets located abroad, $f_1^2(\theta) + t_1^2(\theta)$, and those located at home, $d_1^2(\theta)$. Domestic assets are the liabilities of a corporate entity subject to some domestic juridical authority; thus disputes arising because of ownership rights can be settled fairly readily. Foreign assets, however, are riskier precisely because there is no simple means for the resolution of conflicts between creditors and

ences of the present value of the stock of net foreign assets. We have thus assumed implicitly that the stock defined in eq. (2) can be interpreted as a flow because the economy's original valuation of net foreign assets was zero.

6. Let $\tilde{a}_h$ be the expected present value of the assets of domestic agent h born at some time in the distant future. If there is no explicit program of foreign aid and no bequest motive in the economy, then domestic assets, foreign assets, expected foreign transfers, and thus $\tilde{a}_h$ would all be zero. In this important case, the profile of the aggregate generational current account is simply the change in the present value of the economy's net foreign asset position. Then the analogue of eq. (2) reports the profile of the present value the economy's conventional current account with assets computed at market value.

7. This important subtlety is recognized by Kotlikoff (1993). I think it has been the source of some confusion in the theoretical and practical interpretations of generational accounts for the closed economy. See the interesting and though-provoking debate in Bohn (1992a), Drazen (1992), and Bohn (1992b).

debtors. Thus $\tilde{b}^2(\theta) > 0$ indicates that the domestic economy has become increasingly dependent on assets located abroad in maintaining its standard of living.

Second, the aggregate generational current account shows how changes in policy or exogenous variables affect the welfare of domestic residents. Consider a change in the stochastic processes describing expectations such that neither component of equation (2) decreases and at least one component increases after every relevant history. Such a change has at least three interpretations. First, there has been a capital gain in the market value of net foreign assets, and thus some agent in the home country can expect to enjoy increased consumption now or later. Second, the interest differential has narrowed at all horizons, raising the value of foreign bonds or decreasing the value of domestic liabilities of fixed maturity. Third, the domestic currency has experienced a real depreciation, lowering the value of liabilities denominated in the domestic currency. The crucial point is that each of these phenomena can be interpreted in terms of an increase in the expected utility of a representative agent in the domestic economy. Since equation (2) is defined using domestic aggregates, there exist lump-sum (domestic) taxes such that all agents in the home country are better off.

There is no simple relationship between the conventional government deficit and the aggregate generational current account.[8] Since the conventional government deficit is not well defined, this fact should come as no surprise. Of course, if foreigners do not acquire domestic assets, then government deficits involve only an internal redistribution of wealth among the generations in a country. Then they influence the aggregate generational current account only to the extent that they crowd out outward foreign investment. However, if foreigners do acquire domestic fiat assets, then an internal deficit causes the aggregate generational current account to increase. Thus part of the burden of the national debt is the present value of the interest payments to foreigners.

Another natural measure of an economy's net foreign asset position is the profile of net foreign assets owned by the current and future generations of its residents. In this simple model, the only interesting such cross section is

$$[f_0^1 + t_0^1,\ f_1^1 + t_1^1 + E\{(1 + i(\theta))^{-1} t_1^2(\theta)\}], \tag{3}$$

where the second term depends on the expected transfers from abroad to the agent in generation 1. This cross section must be taken at time 1 because there is no generational heterogeneity at time 2 in this simple model. These values simply divide an economy's net international investment position, measured at market values and inclusive of expected transfers from abroad, among the several current and future generations of domestic residents. Of course, this cross section allows specifically for the generational heterogeneity that is at the heart of Auerbach et al.'s (1991) analogous measure for the domestic economy.

8. Dewald and Ulan (1990) have made this point for the conventional current account.

Measuring (2) or (3) requires making explicit assumptions about the stochastic processes driving exchange rates, interest rates, and international transfer policies. Thus the aggregate generational current account is only as good as the assumptions that are used to construct it, and economists must face an essential paradox. Cash flow accounts, like the conventional current account, are measured quite precisely, but compelling theoretical arguments show that they are potentially devoid of economic meaning. On the other hand, accrual accounts, such as the aggregate generational current account are measured imprecisely, but they do have sound foundations in economic theory. So one is caught between Scylla and Charybdis. Is it nobler to accept an accurate measurement of a meaningless number or to attempt a rough measure of a useful economic concept? Recognizing that I must now make many heroic assumptions, I turn my attention to the latter endeavor using 20 years of data from the Japanese economy.

10.3 Japan's Aggregate Generational Current Account

The Bank of Japan reports regional balance-of-payments statistics in the April and November issues of *Balance of Payments Monthly*.[9] These data are reported in millions of current dollars, and they were the primary source for the historical statistics used to compile the aggregate generational current account for Japan. The data cover the period from 1973 to 1992 and describe regional balances with the United States, Western Europe, the Communist bloc,[10] and Australia. These groups of countries have historically represented more than three-quarters of the aggregate bilateral trade of Japan. Taiwan, Korean, Thailand, and Singapore form the only major trading group that was excluded. Since the data were all reported in current dollars, I used the realized nominal interest rate on long-term government bonds in the United States for all relevant present value calculations.

These regional balance-of-payments data are broken down into the current account and the capital account. In constructing the aggregate generational current account, I focused on inward and outward annual flows of long-term capital. The *Balance of Payments Monthly* reports changes in both assets and liabilities in these categories: direct investments, trade credits, loans, securities, external bonds, and others. I assumed that all assets were denominated in the currency of the host county and that all liabilities were denominated in yen.

Outward direct investment is subject to capital gains for two reasons. First, changes in the exchange rate of the host country influence the market value of assets located abroad. Second, movements in local asset market indexes reflect

9. Matsuoka and Rose (1994) give an excellent guide to Japanese economic statistics. Many Japanese publications have statistical sections with bilingual headings in Japanese and English.

10. This nomenclature is a vestige of the cold war. This group of countries includes Russia, several other Eastern European countries, the People's Republic of China, Cambodia, Vietnam, and other countries.

capital gains and losses in local securities markets. The measure reported in this chapter captures both of these sources of fluctuations in asset prices. Likewise, the market value of inward foreign direct investment into Japan fluctuates as the yen appreciates and depreciates and also as yen-denominated assets experience the vicissitudes of Japanese financial markets.

I assumed that assets and liabilities in the *Balance of Payments Monthly* falling under the four headings "trade credits," "loans," "external bonds," and "others" took the form of long-term debt. However, the aggregate called "securities" includes portfolio investments in both bonds and stocks. Indeed, it is difficult to find statistics that distinguish between portfolio investment in debt and equity. Although the Ministry of Finance reports regional portfolio investment in the August issue of *Zaisei Kinyu Tokei Geppo* (Monthly Statistics on Government Finance), it seems that these data do not differentiate between portfolio investment in bonds and in equity. Using data on Japanese investment into the United States reported in the *Survey of Current Business*, I assumed arbitrarily that 40 percent of the value of outward Japanese portfolio investment was in equities and the rest in bonds.[11] I imposed the condition that these shares were also true of inward portfolio investment into Japan.

The appropriate asset market deflator for long-term debt is an index of bond prices for the relevant currency denomination. Long-term interest rates on government debt are reported in the International Monetary Fund's *International Financial Statistics*, and it was assumed that the average duration of the bonds in question was 10 years. Then a simple formula allows one to construct a bond price index for four of the five regions.[12] These indexes are graphed in figure 10.1. That figure shows that the general drop in interest rates in the past decade was a source of capital gains for Japanese investors holding long-term debt denominated in dollars and sterling.

The International Monetary Fund's *International Financial Statistics* also reports price indexes for industrial shares in the markets of Japan, the United Kingdom, the United States, and Australia. Following Dewald and Ulan (1990), I revalued Japanese outward and inward foreign direct investment using local market indexes.[13] These indexes are graphed in figure 10.2. Thus Japanese investors holding equity in the United States and Europe enjoyed appreciable capital gains in the past decade.

11. The June 1990 issue of the *Survey of Current Business* (56, table 1) shows that Japanese investors acquired $115 billion of U.S. securities other than Treasury securities in 1988 and 1989. They acquired $69 billion in corporate and other bonds and $46 billion in corporate stocks in America those two years.

12. See Sharpe, Alexander, and Bailey (1995, 469–71) for a good discussion of duration and bond prices. I used bond prices in the United Kingdom as a proxy for European bond prices, and I assumed that all debt extended to the Communist bloc was denominated in dollars. Thus the bond index for the United States was also used to evaluate the market price of debt in the Communist bloc. If the average duration of debt is actually less than 10 years, then these indexes overstate the effects of interest rate changes on the prices of bonds.

13. The index for the Communist bloc is simply an index of nominal GDP in the People's Republic of China.

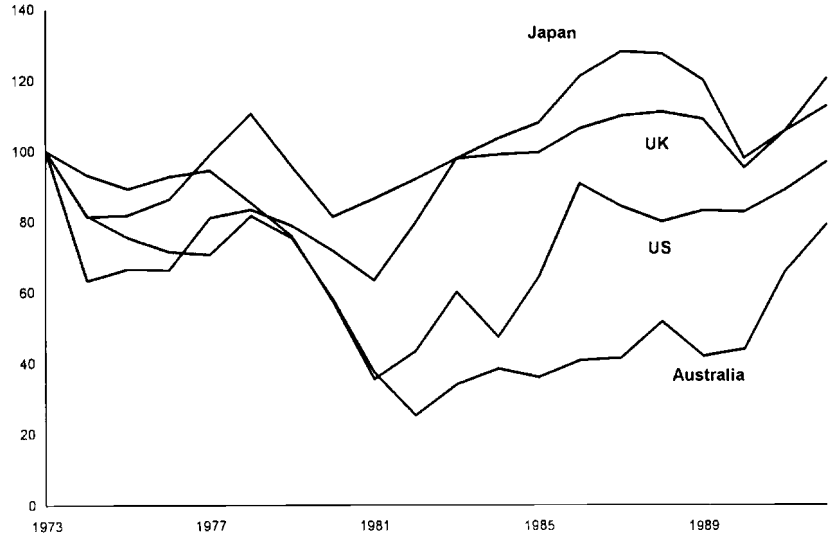

Fig. 10.1 Bond price indexes

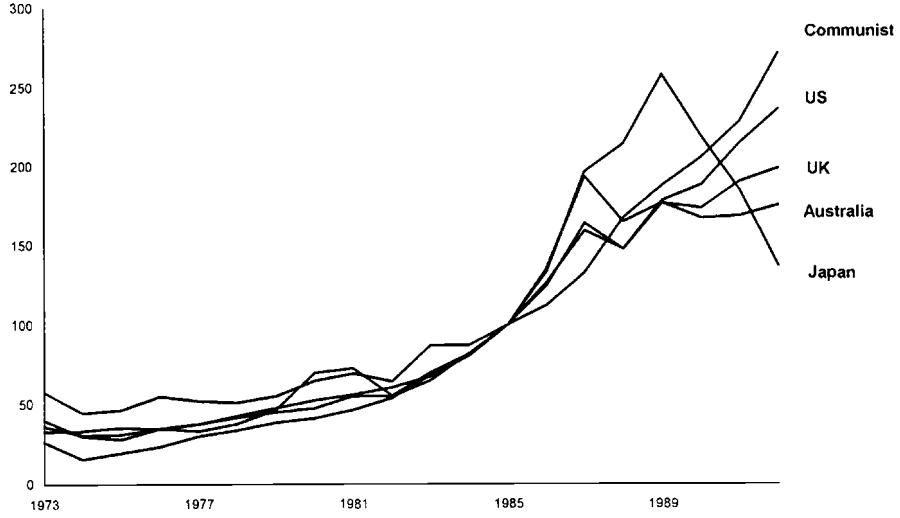

Fig. 10.2 Industrial share price indexes

The last effect that must be accounted for in constructing the market value of the net international position is the effect that currency prices have on the market value of direct or portfolio investment. I used the end-of-period exchange rates reported in *International Financial Statistics* to adjust the value of the stock of assets accordingly. These exchange rates are the dollar prices

of the yen, the pound sterling, the Australian dollar, and the huan. The exchange rate indexes are graphed in figure 10.3. They confirm the general long-term appreciation of the yen against the dollar and the analogous depreciation of sterling, the Australian dollar, and the huan. Thus Japanese outward direct investment has suffered capital losses owing to exchange rate movements in each of these broad regions, while inward investment into Japan has experienced capital gains owing to the appreciation of the yen.

These indexes enable one to calculate the market value of Japanese outward and inward direct investment.[14] The rapid increase in Japanese outward direct investment first occurred early in the past decade. In 1982, the market value of Japan's net foreign assets was $12 billion, and by 1992, that figure had grown to $687 billion. Also, by 1992, Japan held 76 percent of its net foreign assets in the United States and 10 percent in Europe. The share of net foreign assets in Australia was 11 percent and that in the Communist bloc was 3 percent. Since the low volume of direct investment into Japan is well documented,[15] these shares show that Japan's outward foreign investment in the past decade was directed primarily into the United States. Indeed, movements in American asset prices have an increasingly important role in determining the market value of Japanese assets and thus influence Japan's aggregate generational current account. In essence, the well-being of Japanese residents is much more dependent, both absolutely and relatively, on macroeconomic factors in the United States than was the case two decades ago.

Table 10.1 presents Japan's aggregate generational current account. Column (1) shows the market value of Japan's international investment position; net foreign assets were adjusted using the price indexes and exchange rates displayed above. The market value of these net assets is about 60 percent higher than the Bank of Japan's own figure for 1992.[16] The surge in Japanese outward investment coincided with the boom in world equity markets after the recession of the past decade; thus Japan's overseas investments have shown strong capital gains. Still, the outward investments in Europe bore a better rate of return than those in the United States. Also, although the rate of return on holding yen-denominated assets was quite high in the past 15 years, the low volume of inward investment into Japan has limited the increase of Japan's liabilities vis-à-vis the rest of the world.

Column (2) of table 10.1 presents Japan's net transfers from abroad. Fisher

14. Let K_t^i be the market value in dollars of direct investment in country i at time t. Let I_t^i be the analogous increase in the dollar value of assets. I used the recursive relationship

$$K_{t+1}^i = K_t^i(P_{t+1}^i / P_t^i)(S_t^i / S_{t+1}^i) + I_{t+1}^i,$$

where P_t^i is the relevant asset price index and S_t^i is the dollar price of a unit of currency i both at time t.

15. See Lawrence (1993) for an extensive discussion.

16. Table 17 of the *Balance of Payments Monthly* for April 1993 states that the dollar value of Japan's external assets at the end of 1992 was $514 billion.

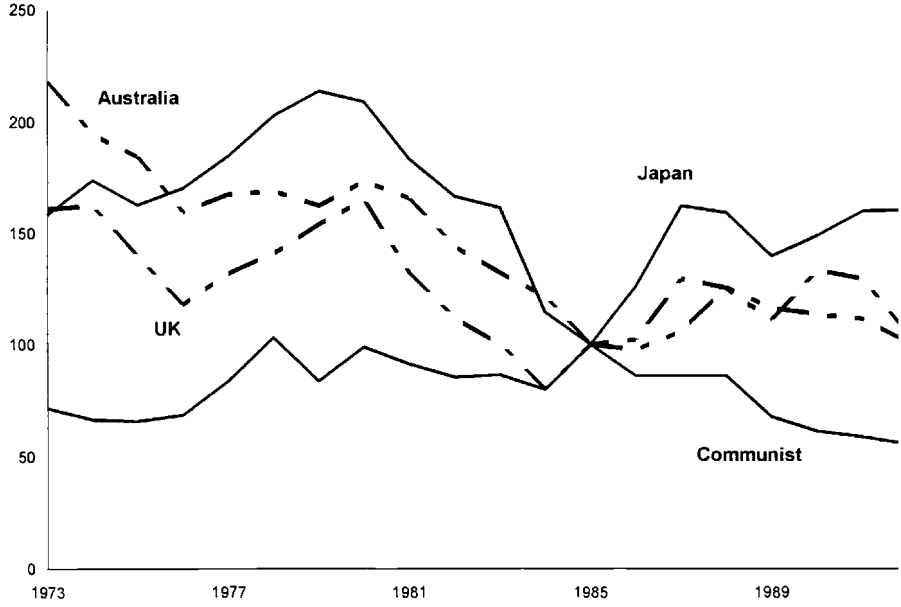

Fig. 10.3 Exchange rate indexes

and Woo (1997) computed the present value of capitalized transfers for Korea, but they made the assumption that military and economic transfers into Korea formed a part of the United States' long-run military policy. I have made the judgment here that Japan's transfers to abroad are not part of ongoing international commitments. This opinion reflects the role imposed by the United States on Japan in the postwar era. Indeed, the single large transfer of $12 billion in 1991 was a contribution to the Allies' defense of Kuwait. This compensation is precisely the kind of one-off payment showing that these unilateral transfers are not part of a continuing geopolitical role imposing long-run liabilities on the residents of Japan.

Column (3) in table 10.1 gives the present value of the net foreign assets of Japan under the assumption that the value of these assets was zero at the beginning of 1973. It is impressive that the dollar value of Japanese net foreign assets has grown more rapidly than the nominal interest rate in the past 20 years. Of course, such an accumulation reflects a rapid increase in the expected flow of goods and services into Japan in the future. The aggregate generational current account is given in column (4) of table 10.1; this column simply presents first differences of the data in the previous column. It shows that the rapid increase in the present value of Japanese net foreign assets first occurred in 1982. Thus the end of the last major recession marked the advent of Japan's sustained external surplus. This observation is confirmed by the data on the present value of the conventional current account reported in column (5). The

Table 10.1 **Japan's Aggregate Generational Current Account**

Year	Net International Investment Position at Market Values (1)	Transfers from Abroad (2)	Present Value of (1) + (2) (3)	Aggregate Generational Current Account (4)	Present Value of the Conventional Measure (5)
1973	4,580	−210	4,370	4,370	−136
1974	5,630	−203	5,079	709	−4,393
1975	4,792	−272	3,933	−1,146	−593
1976	4,336	−204	3,330	−603	2,965
1977	4,216	−194	3,011	−318	8,176
1978	7,596	−230	5,135	2,124	11,526
1979	15,072	−755	9,206	4,071	−5,629
1980	10,201	−1,288	5,237	−3,969	−6,155
1981	5,886	−1,405	2,362	−2,875	2,514
1982	11,809	−1,297	4,865	2,502	3,170
1983	26,257	−1,369	10,193	5.328	8.518
1984	49,737	−1,372	17,827	7,634	12,902
1985	96.186	−1,375	31,057	13,231	16,106
1986	199,459	−1,465	58,631	27,573	25,421
1987	297,586	−2,697	81,096	22,465	23,929
1988	370,651	−3,007	93,286	12,190	20,206
1989	448,088	−3,253	103,695	10,410	13,324
1990	582,268	−4,468	124,139	20,444	7,683
1991	661,101	−11,834	128,506	4,367	14,429
1992	687,291	−3,362	125,502	−3,004	21,571

Note: Figures are in millions of dollars.

aggregate generational current account and the present value of the conventional measure are highly correlated; they differ in years when large fluctuations in asset prices or exchange rates precipitate large changes in the market value of net foreign assets. At such times, the conventional current account surplus is a poor measure of the increase in the expected present value of resources imported from abroad in the future.

10.4 The Generational Pattern of Ownership of Net Foreign Assets

Who owns Japan's net foreign assets? The data in section 10.3 showed how the market value of Japan's net international investment position has evolved since 1973. But who has benefited from the large capital gains that Japan experienced on its outward investment in the past decade? And who owes the relatively small amount of yen-denominated liabilities that Japan has issued during the past 15 years? This section answers those questions by assuming that these assets and liabilities are allocated according to the patterns of saving and borrowing of Japan's residents during the past three decades.

Japan's savings rate rose and then fell in the past three decades; Horioka (1993) gives a good historical overview, and Ito and Kitamura (1994) show

how savings rates in Japan are influenced by public policy. The Statistics Bureau of Japan's Management and Coordination Agency presents time series on family income and expenditure in Japan. It gathers these data from a random sample of households of Japanese residents. I used data from the bureau's *Comprehensive Time Series Report on the Family Income and Expenditure Survey: 1947–1986* (1988) to construct the savings and borrowing rates of 13 different "generations" of Japanese residents.

A generation is a cohort of Japanese residents born during the five-year period whose central year is used as its label. I identify the first generation with 1906,[17] and subsequent generations occur quinquennially until 1966. For each year between 1966 and 1986, the Family Income and Expenditure Survey gives the total savings and liabilities of the average household in a generation, and it describes the number of households sampled. Thus I was able to compute the share of total savings and also total liabilities that accrued to any one generation in the sample. I used data from the years 1973, 1978, 1983, and 1988[18] to construct the savings and borrowing rates for each of the generations in my sample. In 1973, the generations born later than 1951 were assumed not yet economically active, and by 1988, the generations born after 1966, including those not yet born in 1991, were analogously inactive.

The savings rates were used to allocate new outward investment to the agents in the generations economically active in that year. Likewise, the borrowing rates were used to assign new yen-denominated liabilities among the generations active in that year. Since Japan's transfers to abroad have not been enduring, I allocated each year's unilateral transfers as a lump-sum tax whose burden was distributed uniformly on the agents who were economically active in that year. Then I was able to construct the market value of the net international investment position of each generation for each year between 1973 and 1992. These calculations are entirely analogous to those underlying the construction of the market value of Japan's net international investment position, inclusive of the burden of unilateral transfers to abroad, but new investment and new borrowing are assigned in each year according to the savings and borrowing rates of the economically active generations. These data are stocks of assets, and they are denominated in current dollars. Finally, I divided them by the number of people in each generation in 1993. Thus the data are presented in 1992 dollars per person.

Column (1) of table 10.2 presents the generational pattern of Japan's net international investment position, broadly defined. The calculations presented in table 10.2 make the assumption that a generation's mortality rate is 6 percent per quinquennium, independent of the age of the cohort. Column (1) is a benchmark showing that members of the oldest generation in 1992 own substantial net foreign assets. The generation born around 1926 has benefited from

17. My first generation is really people born before 1909 who are still alive in 1993, but I identify this group with the 1906 generation, those born between 1904 and 1908, inclusive. In contrast with Auerbach et al. (1991), I put males and females together.

18. I actually used data from 1986 as a proxy for those from 1988.

the capital gains in world securities markets more than those before and after it because its years of peak savings occurred at the time when Japan's external surplus first began to grow most rapidly and world asset markets were historically undervalued. The modest positions of the generations born around 1961 and 1966 reflect the fact they paid for Japan's contribution to the Persian Gulf War before they had begun to accumulate substantial net foreign assets. Generations born after 1966 have no net foreign assets because they are not economically active and I have assumed they have no liability for future transfer payments to abroad.

The calculations inherent in column (1) of table 10.2 allow me to make forecasts about the effects of three different policy scenarios on the welfare of these different generations. I examine three changes in exogenous variables from the 1992 benchmark: a strong yen, a rise in dollar interest rates, and rapid economic growth in China. The first situation entails an appreciation of the yen: a rise in the dollar price of the yen from 0.00816 (its value in 1992) to 0.0125 dollars per yen (near its current value in 1995). The second assumes that dollar interest rates rise from 7.01 percent per annum (its value in 1992) to 10.00 percent per annum. The third situation assumes that Chinese economic growth stays more robust than the world average; I modeled this as a 20 percent capital gain in the Japanese assets in the Communist bloc.

Columns (2), (3), and (4) of table 10.2 show the outcomes of each of these scenarios respectively. A strong yen causes a Pareto worsening for the Japanese

Table 10.2 **Generational Pattern of Japanese Net Foreign Assets**

Generation	Net Foreign Assets (1)	Yen Appreciation (2)	Higher Dollar Interest Rates (3)	Robust Chinese Growth (4)
1906	23,544	22,045	22,031	23,571
1911	23,563	22,077	22,050	23,590
1916	23,201	21,339	21,675	23,228
1921	22,531	20,100	20,976	22,559
1926	18,248	14,041	16,743	18,275
1931	13,633	9,211	12,367	13,657
1936	8,134	3,358	7,150	8,152
1941	4,566	(855)	3,717	4,581
1946	3,711	(1,016)	2,980	3,725
1951	1,832	(2,218)	1,276	1,843
1956	1,777	(832)	1,367	1,785
1961	1,397	(212)	1,111	1,403
1966	494	358	431	495
1971	0	0	0	0
1976	0	0	0	0
1981	0	0	0	0
1986	0	0	0	0
1991	0	0	0	0
After 1991	0	0	0	0

Note: Figures are in 1992 dollars per person.

because the real value of their liabilities have risen. Thus the present value of net foreign assets for every generation is lower, and generations in their middle age in 1992 suffer capital losses especially.[19] These generations have incurred liabilities to foreigners as Japan's traditional barriers to inward foreign investment have relaxed slightly in the past decade. Higher dollar interest rates are a capital loss on the dollar-denominated bonds that are such a large part of the net foreign assets of many generations. A rise in dollar rates is Pareto inferior to the benchmark. Still, this situation is not Pareto superior to the strong yen scenario; the generations born around 1911 and 1916 actually lose slightly more in this situation than they do under a strong yen. Finally, even if the Chinese economic boom continues, there will be little effect on the Japanese. This is so because Japan held only 3 percent of its net foreign assets in the Communist bloc in 1992. Capital gains on Chinese assets represent a slight Pareto improvement over the benchmark.

The important point in each of these three cases is that these generational profiles of assets illustrate in intuitive ways the effects that changes in macroeconomic variables have on the welfare of the Japanese. For example, the generational asset profiles worsen immediately when the yen appreciates. Since the trade balance adjusts over time, the conventional current account worsens only slowly in analogous historical situations. The aggregate generational current account shows that the real effects of a strong yen are the immediate capital losses sustained by Japanese investors owing net foreign assets. These losses are so obvious that they have become the standard grist of financial journalists in the last few months. The conventional current account barely captures such contemporaneous effects at all.

10.5 Conclusion

This chapter has presented a measure of the Japanese external surplus that has its foundation in economic theory. The Japanese have accumulated net foreign assets at a remarkable rate in the past 20 years, and their economic well-being is now inextricably tied into the smooth functioning of the world financial system. There have been other countries that have accumulated net foreign assets at a pace greater than the rate of interest over long periods: Britain in the nineteenth century and the United States in the twentieth century are two important examples. It is tempting to draw historical parallels between the overvaluation of the sterling after the First World War and the current strength of the yen. But I am not a bold or competent enough historian to predict that Japan will suffer a prolonged deterioration in its standard of living if the yen remains as strong as it is now. Still, a generational perspective on the external surplus shows that large movements in the real exchange rate have immediate effects on the market value of assets.

19. I am implicitly assuming a real appreciation of the yen. In a world with not traded goods, the negative income effect of the yen appreciation is not fully offset by a drop in all consumer prices.

Finally, it is important that international economists recognize that the conventional current account depends on the timing of cross-border payments. The International Monetary Fund's *Balance of Payments Manual* (1977) is a classic statement of careful cash-flow accounting principles, and I have relied on it in interpreting the capital account statistics that I have analyzed in this chapter. I am not advocating throwing out the baby with the bathwater because it is indeed obvious that the conventional current account is highly correlated with the aggregate generational current account. Thus the conventional measure does have practical economic significance, especially if one is willing to interpret the conventional current account within the discipline of an explicit economic model. But accurate cash-flow accounts are only part of a bigger picture, and I hope that this chapter spurs further research into accrual-based international accounts.

Appendix
Description of the Data

The data on the net foreign assets of Japan were constructed from the annual long-term capital transactions reported in the regional balance of payments summaries in the April issues of the Bank of Japan's *Kokusai Shushi Tokei Geppo* (Balance of Payments Monthly). The capital account covers six categories: direct investments, trade credits, loans, securities, external bonds, and others. The four regions selected were not entirely consistent across the 20 years of the sample. The geographic definitions for the United States and the Communist bloc are consistent. That for Europe actually covers the United Kingdom and the European Community in 1973 and 1974 and corresponds to the European Economic Community, including its new members as it enlarged, between 1975 and 1992. The data for Australia include New Zealand and South Africa until 1981, and they consist of the category "other OECD" from 1982 to 1988. After that they include Australia alone. The disaggregated Japanese capital account figures reverse the signs for assets (outward flows of capital) but not for liabilities in the years from 1973 to 1978. Since the aggregated figures always follow the usual convention (an increase in assets takes a negative sign), this inconsistency can be vexing. Future researchers beware!

In later years, *Kokusai Shushi Tokei Geppo* also includes a table on the external assets and liabilities of Japan. The text uses figures from this table when comparing the market value of Japan's net foreign assets with the official figures reported by the Bank of Japan.

Direct investments and 40 percent of the value of securities were revalued using the annual industrial share price indexes given in the International Monetary Fund's *International Financial Statistics*. The indexes were for Japan, the

United States, the United Kingdom, and Australia. The analogous series for the Communist bloc was an index of the national income of the People's Republic of China at market prices as reported in *International Financial Statistics*. The categories "trade credits," "loans," 60 percent of "securities," "external bonds," and "others" were revalued using a bond price index constructed from the annual interest rates on long-term government debt reported in *International Financial Statistics*. Again, the data are interest rates from Japan, the United States, the United Kingdom, and Australia. It was assumed that debt extended to the Communist bloc was denominated in dollars. The exchange rate indexes are the end-of-period dollar prices of foreign exchange for Japan, the United Kingdom, the People's Republic of China, and Australia, all taken from *International Financial Statistics*.

The data on household saving and borrowing rates are from the Statistics Bureau of Japan's Management and Coordination Agency's *Comprehensive Time Series Report on the Family Income and Expenditure Survey, 1947–1986* (table 8-2). I used the columns entitled "no. of tabulated households," "savings," and "liabilities" from the years 1973, 1978, 1983, and 1986 (as a proxy for 1988). The 1993 populations for the different generations are reported in the Statistics Bureau of Japan's Management and Coordination Agency's *Japan Statistical Yearbook, 1995* (table 2–9). The per capita asset figures assume implicitly all assets acquired between 1973 and 1992 by a given generation are held by the members of that generation living in 1993.

The text refers at several times to the U.S. Department of Commerce's *Survey of Current Business*. The data giving U.S. international transactions by area (September 1994, table 10) were the basis for allocating 60 percent of securities to bonds and the rest to equity. Tables 5.1 and 5.2 of the May 1994 issue report data on Japan's direct investment into the United States by industry in 1992 and 1993.

References

Ablett, John. 1996. Generational accounting—An Australian perspective. *Review of Income and Wealth* 42:91–105.

Auerbach, Alan J., J. Gokhale, and L. J. Kotlikoff. 1991. Generational accounts: A meaningful alternative to deficit accounting. In *Tax policy and the economy*, vol. 5, ed. David Bradford. Cambridge, Mass.: MIT Press.

———. 1994. Generational accounting: A meaningful way to evaluate fiscal policy. *Journal of Economic Perspectives* 8:73–94.

Bohn, Henning. 1992a. Budget deficits and government accounting. *Carnegie-Rochester Conference Series on Public Policy* 37:1–84.

———. 1992b. Budget deficits and government accounting: Reply to Allan Drazen. *Carnegie-Rochester Conference Series on Public Policy* 37:93–95.

Dewald, William G., and M. Ulan. 1990. The twin-deficit illusion. *Cato Journal* 9: 689–718.

Drazen, Allan. 1992. Problems of government accounting: A comment. *Carnegie-Rochester Conference Series on Public Policy* 37:85–92.

Fisher, Eric O'N. 1995. A new way of thinking about the current account. *International Economic Review* 36:555–68.

Fisher, Eric O'N., and YoungSoo Woo. 1997. Meaningful measures of the current account. *Review of International Economics* 5:452–66.

Horioka, Charles Y. 1993. Savings in Japan. In *World savings: An international survey,* ed. A. Heertje. Oxford: Blackwell.

International Monetary Fund. 1977. *Balance of payments manual,* 4th ed. Washington, D.C.: International Monetary Fund.

———. Various issues. *International financial statistics yearbook.* Washington, D.C.: International Monetary Fund.

Ito, Takatoshi, and Yukinobu Kitamura. 1994. Public policies and household saving in Japan. In *Public policies and household saving,* ed. J. Poterba, 133–60. Chicago: University of Chicago Press.

Japan. Bank of Japan. Foreign Department. Various issues. *Kokusai shushi tokei geppo* (Balance of payments monthly). Tokyo: Bank of Japan.

———. Management and Coordination Agency. Statistics Bureau. 1988. *Comprehensive time series report on the Family Income and Expenditure Survey: 1947–1986.* Tokyo: Statistics Bureau.

———. 1995. *Japan Statistical Yearbook, 1995.* Tokyo.

———. Ministry of Finance. Various issues. *Zaisei kinyu tokei geppo* (Monthly statistics on government finance).

Kotlikoff, Laurence J. 1993. *Generational accounting: Knowing who pays, and when, for what we spend.* New York: Free Press.

Lawrence, Robert Z. 1993. Japan's low levels of inward investment: The role of inhibitions on acquisitions. In *Foreign direct investment,* ed. K. A. Froot, 85–107. Chicago: University of Chicago Press.

Matsuoka, Mikhiro, and B. Rose. 1994. *The DIR guide to Japanese economic statistics.* Oxford: Oxford University Press.

Sharpe, William F., G. J. Alexander, and J. V. Bailey. 1995. *Investments,* 5th ed. Englewood Cliffs, N.J.: Prentice-Hall.

Sterngold, James. 1995. Hollywood 1, Japan 0. *New York Times,* 16 April 1995, sec. 4, p. 5.

Ulan, Michael, and W. G. Dewald. 1989. The U.S. net international investment position: Misstated and misunderstood. In *Dollars deficits and trade,* ed. J. A. Dorn and William A. Niskanen. Norwell, Mass.: Kluwer.

U.S. Department of Commerce. Economics and Statistics Administration. Bureau of Economic Analysis. Various issues. *Survey of Current Business.* Washington, D.C.: Bureau of Economic Analysis.